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STUDY ON BLOOD PRESSURE MEDICATION: SHOULD IT BE TAKEN IN THE MORNING OR EVENING

[1]Dr. Naeema Firdous, [2]Dr. Seemab Hassan, [1]Dr. Qurat-ul-ain Zaffar

[1]Women Medical Officer at DHQ Hospital, Khanewal

[2]Women Medical Officer at Social Security Hospital, Jhang

Abstract:

Introduction: *Sleep blood pressure (BP) is a powerful predictor of cardiovascular complications, and there is suggestive evidence that controlling BP during sleep has beneficial outcomes. When drugs are given in the morning, the drug concentration may be lowest at the time when good BP control is desirable.* ***Objectives of the study:*** *The basic aim of the study is to analyze the medication of blood pressure. Our main objective is to find the correct time of medication either it would be morning or evening.* ***Methodology of the study:*** *This study was conducted at DHQ hospital Khanewal, Pakistan during 2018. This study was conducted according to the rules and regulations of ethical committee of hospital. This research will help towards next findings of effect of blood pressure in hypertension and its responsible factors.* ***Results:*** *In the present study, the numerical falls in sleep (night-time) SBP and DBP at all time periods presented were greater than the daytime fall on both the morning, and night-time dose of valsartan and on lisinopril, though there is no statistical analysis of this effect.* ***Conclusion:*** *It is concluded that there are several factors which are responsible of elevation and decreasing blood pressure but that is required to clarify the advice to give to the treating physician is one in which the medication is given when awake or in the evening, and medication is titrated by usual clinic BP. The result needs to be monitored by 24-h BP measurements to determine which strategy is most effective in achieving optimal control.*

Corresponding author:

Dr. Naeema Firdous,

Women Medical Officer at DHQ Hospital, Khanewal

QR code

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INTRODUCTION:

Sleep blood pressure (BP) is a powerful predictor of cardiovascular complications, and there is suggestive evidence that controlling BP during sleep has beneficial outcomes. When drugs are given in the morning, the drug concentration may be lowest at the time when good BP control is desirable. This has led to the idea that it may be preferable to give medication in the evening. Much epidemiologic, experimental, and clinical data confirm the relevance of nutritional factors in determining blood pressure (BP) in the population as a whole, and among subjects with hypertension [1]. Factors epidemiologically related to BP such as weight, caloric intake, and the minerals sodium, potassium, calcium, and magnesium also have been the focus of therapeutic intervention trials. These trials have shown that lowering dietary calorie, alcohol, or salt content, and providing increased amounts of calcium, potassium, or magnesium may each lower BP in at least some "sensitive" subjects [2].

Hypertension is a noteworthy hazard factor for various genuine health conditions, including cardiovascular ailment, cerebrovascular malady, and constant kidney illness [3]. Worldwide, 9.4 million passing are credited to difficulties from hypertension, including 45% of all passing because of coronary vein illness and 51% of all passing because of stroke [4]. These relations are steady in the two people, in youthful, moderately aged, and more seasoned subjects, among different racial and ethnic gatherings, and inside and between nations. In spite of the fact that there is a continuum of cardiovascular hazard crosswise over levels of circulatory strain, the characterization of grown-ups as indicated by pulse gives a system to differentiating levels of hazard related with different circulatory strain classes and for characterizing treatment edges and helpful objectives [5].

Despite the fact that subjects with high-ordinary circulatory strain are probably going to have a hoisted danger of cardiovascular infection (given the continuum of hazard), there is a scarcity of data in regards to the supreme and relative dangers of cardiovascular ailment in these people [6]. In spite of the fact that information on deadly coronary occasions and strokes in people with high-typical circulatory strain are accessible, data on the danger of nonfatal cardiovascular occasions among individuals in this pulse class is restricted. We attempted a planned examination of the danger of cardiovascular sickness in people with high-typical pulse [7].

Background of the study

The most critical is the relationship between the time of taking medication and BP measurement. If a person takes the medication in the morning and BP is measured sometime after, there may be a false sense of achievement. Many angiotensin-converting enzyme (ACE) inhibitors, in particular, and some ARBs also have a half-life much less than 24 h, and depending on the dose, the BP-lowering effect may not last for 24 h. The dose range for such drugs is wide. Enalapril's dose is 5–40 mg/day. The response to these doses of enalapril, 4 h after administration, is similar, but only 20 and 40 mg have an effect that endures for 24 h. When enalapril was initially studied in trials in which titration was decided on BP measured before taking medication in the morning, the average dose was greater than 20 mg. However, survey of medication use, in general practice, revealed that the average dose used was less than 15 mg/day[8]. Valsartan has been used to treat hypertension in a range of doses from 80 to 320 mg/day. Studies comparing telmisartan 80 mg with valsartan 160 mg indicate that between 18 and 24 h after dosing in the morning, valsartan has a reduced BP-lowering effect compared with telmisartan. Thus, if BP is measured after medication had been taken; it is likely that the drug will not be titrated to a dose that gives optimal 24-h BP control. If, however, medication is taken at night, BP will be measured at least 12 h after medication and it is more likely that the correct dose will be reached. This was the rationale behind a study by Morgan *et al.[6]* in 1997 in which perindopril was given in a crossover design study in the morning or at night. This was a fixed-dose study. Perindopril, given in the morning, had full 24-h duration of action, and night-time and morning BP was controlled to a similar extent to that when the same dose was taken in the evening [9].

Objectives of the study

The basic aim of the study is to analyze the medication of blood pressure. Our main objective is to find the correct time of medication either it would be morning or evening.

METHODOLOGY OF THE STUDY:

This study was conducted at DHQ hospital Khanewal, Pakistan during 2018. This study was conducted according to the rules and regulations of ethical committee of hospital. This research will help towards next findings of effect of blood pressure in hypertension and its responsible factors.

Data collection

The data was collected from 100 patients which was suffering from high blood pressure and any kind of heart issue. We find the Initial and fall in SBP (mmHg) during day and night on the different therapies. We collect some demographic information regarding age, sex, socio-economic status and history of blood pressure. Then in second part we collect data regarding high blood pressure and heart issues. For this purpose we prepare a questionnaire and fill that from patients.

Statistical analysis

Student's t-test was performed to evaluate the data. The relations of BP to other variables were analyzed by linear regression and Pearson correlation coefficients. Multiple regression analysis studied the interdependence of these relations among variables found to correlate significantly with BP. Data are expressed as the mean ± SD.

RESULTS:

In the present study, the numerical falls in sleep (night-time) SBP and DBP at all time periods presented were greater than the daytime fall on both the morning, and night-time dose of valsartan and on lisinopril, though there is no statistical analysis of this effect. These data are summarized in Table 01.

Table 01: Analysis of medication of BP

	Daytime			Night-time		
Medication	Initial BP	Fall in BP	% fall in BP	Initial BP	fall in BP	% fall in BP
Week 12						
Valsartan 320 mg a.m.	147.5	10.7	7.0	133.9	11.2	8.4
Valsartan 320 mg p.m.	147.1	9.5	6.5	132.3	10.3	7.9
Lisinopril 40 mg	147.7	10.5	7.0	132.7	11.5	8.7
Week 26						
Valsartan 320 mg a.m.	147.5	13.3	9.0	133.9	13.7	10.2
Valsartan 320 mg p.m.	147.1	12.4	8.4	132.3	12.7	9.6
Lisinopril 40 mg	147.7	13.5	9.2	132.7	14.0	10.5
Mean falls		11.65	7.85		12.6	9.21

Data derived from Zappe *et al.* [1]. No statistics performed but in every situation the absolute and %age fall in both systolic and diastolic night-time BP was greater than the fall in daytime BP.

There are number of factors which influence on blood pressure levels. Age, cholesterol, BMI and diet are the main factors which directly effect on blood pressure levels. Table 02 shows the values of control group and diseased group which was suffering from the low and high blood pressure problems.

Table 02: Statistical analysis values of Control group and diseased group

Variable	Diseases Group	Control Group	t Value	*p* Value
Age （Year）	56.56±8.46	53.64±8.36	1.716	0.081
BMI （kg/m2）	24.31±2.26	23.37±2.09	2.195	0.031
SBP （mmHg）	140.36±15.70	116.53±13.46	8.248	0.000
DBP （mmHg）	87.94±10.69	75.81±9.94	5.967	0.000
PP （mmHg）	52.42±12.87	40.72±8.74	5.426	0.000
FBG （mmol/）	5.12±0.65	5.06±0.49	1.764	0.081
TG （mmol/L）	1.74±0.75	1.69±0.86	1.838	0.071
TC （mmol/L）	4.95±0.76	4.88±0.82	1.712	0.090
HDL-	1.30±0.43	1.31±0.56	1.717	0.089
LDL-C	3.46±0.58	3.38±0.66	1.139	0.266

DISCUSSION:

Certain issues arising from previous nutritional interventions in hypertension form the basis of the present study[9]. First, the physiological basis underlying effects of diet on BP trials have included remains uncertain, as most previous intervention le biochemical data. Second, with few exceptions, these studies have tested the efficacy of altering single dietary components, with little assessment of the benefit of overall diets meeting current nutrient recommendations [10]. Third, current diet policies have achieved only limited success, perhaps as a result of the lifestyle changes involved in their implementation. We have begun to address these issues by analyzing the BP, weight, biochemical, and hormonal responses to two food plans conforming to current guidelines of the American Heart Association and the National Academy of Sciences, and administered to un medicated normotensive and hypertensive subjects with and without concomitant hyperlipidemia as part of a multicenter, randomized, controlled clinical trials [11].

High blood pressure was the leading risk factor for the overall global burden of disease in 2010. The recent decrease in cardiovascular mortality in high-income countries has been associated with a rise in the numbers of patients living with cardiovascular disease, and the wider use of preventive drugs. Thus, an up-to-date understanding of the associations of blood pressure with different non-fatal and fatal cardiovascular disease outcomes would help to refine strategies for primary prevention and inform the design of future clinical trials [11].

The Prospective Studies Collaboration meta-analysis of 61 cohorts recruited between 1950 and 1990 reported log-linear associations of systolic and diastolic blood pressure with death from ischaemic heart disease and stroke, with no apparent threshold below which no further reduction in risk is observed, down to a blood pressure of 115/75 mm Hg, in participants aged 40–89 years [12]. These findings predated several public health initiatives, including efforts to reduce salt consumption and tobacco use, and the more widespread use of blood pressure-lowering treatments for primary prevention, and did not provide information about major chronic and non-fatal diseases, including heart failure, peripheral arterial disease, abdominal aortic aneurysm, and stable angina [13]. Importantly, no current estimates are available for the lifetime incidence and years of life lost associated with hypertension attributable to specific cardiovascular diseases[9]. Although in previous studies investigators have estimated the associations of cardiovascular disease risk factors with lifetime risks or cardiovascular disease-free years of life lost, their focus was on total cardiovascular disease, with only one study so far to have analyzed the incidence of specific cardiovascular diseases in a competing risks context[12].

CONCLUSION:

It is concluded that there are several factors which are responsible of elevation and decreasing blood pressure but that is required to clarify the advice to give to the treating physician is one in which the medication is given when awake or in the evening, and medication is titrated by usual clinic BP. The result needs to be monitored by 24-h BP measurements to determine which strategy is most effective in achieving optimal control.

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